STATE OF ILLINOIS

ILLINOIS COMMERCE COMMISSION

COMMONWEALTH EDISON COMPANY

DOCKET NO. 82-0026

PROPOSED GENERAL INCREASE IN ELECTRIC RATES

DIRECT TESTIMONY

OF

ED BODMER

WITNESS QUALIFICATIONS

My name is Edward Bodmer and my business address is 527 East Capitol Avenue, Springfield, Illinois 62706.

I have been employed by the Illinois Commerce Commission, Public Utilities Division, Accounts and Finance Department since June, 1979.

I graduated from the University of Illinois urbana Campus in May of 1979 with a B.S. degree in Finance. I also earned the equivalent of a B.S. in economics and completed 17 credit hours of mathematics. I graduated with highest honors and a 5.0/5.0 scholastic average. I was awarded University Honors and the Bronze Tablet in 1979. I was elected to the Beta Gamma Sigma honorary business fraternity as a junior and I won the "Scholarship Key Award" given by the Alpha Kappa Psi professional business fraternity as a senior. I have completed additional course work in accounting at the University of Illinois and I am currently enrolled in the graduate business school at the University of Chicago.

I have testified in various cases before the Commission on subjects ranging from cost of capital to excess reserve capacity. I have co-authored a paper on the Economic Recovery Tax Act of 1981 with Dr. Stalon and I am a session chairperson at the coming NARUC bi-ennial conference.

INTRODUCTION

My testimony includes various accounting adjustments, a summary of the effects of other financial and accounting testimony of Staff, a short-term corporate financial forecast, a proposal for an alternative to CWIP in rate base, and an evaluation of the option to delay the Braidwood nuclear units.

On Commonwealth Edison Company Exhibit 2, Schedule S-21, Mr. Heumann shows required revenue increases of $743.4 million, $905.7 million, and $452.6 million in 1984, 1985 and 1986. Staff's alternative to CWIP proposal can reduce the 1985 increase by $164 million, the 1986 increase by $161 million, and reduces required revenues in 1987-1989 by $194 million. In addition, my summary of other Staff testimony demonstrates that if all Staff recommendations were adopted, revenue requirements could be reduced by as much as $250 million in the current case. Furthermore, my financial projections show that given various assumptions, a rate increase of $230 million above the interim could leave Edison in adequate financial position for the year 1983.

I. Accounting Adjustments

I have made four accounting adjustments for purposes of the current case:

(1) Changing from an end of period to an average rate base (and capital structure).

(2) Revising the inflation factor in non-payroll expenses.

(3) Adjusting the revenue conversion factor to include incremental ITC amortization.

(4) Providing an alternate working capital computation.

(1) Average Rate Base

The test year being employed by Staff and Edison is fully forecast and, as such, incorporates estimates of future inflation. Because of the totally prospective nature of this test period, any additional explicit attrition allowances are inappropriate. Hence, my first adjustment is the utilization of an average 1983 rate base and capital structure instead of the end of year figures submitted by Edison. Exhibit AF-2, Schedule 3 shows the effects of these adjustments. The rationale for end of year rate base and capital structure disappears when the test year is fully forecast and the company will probably seek further rate relief for 1984 and beyond.

(2) Non-Payroll Expenses

Commonwealth Edison Company has assumed a 9-10% inflation factor in non-payroll related operations and maintenance expenses for 1982 and 1983. In fact, due to the methodology Edison employs, it is almost impossible to determine exactly how much inflation has been forecast in these accounts. What we do know is that Edison's current budgets were prepared in autumn of 1981, when reasonable inflation expectations were substantially above what they are today (the wholesale price index for instance has shown only slight increases in calendar 1982). I have made an adjustment to non-payroll operations and maintenance expense assuming that the 15% increase in 1983 over 1982 levels (from $438.8 million to $505.1 million) includes a 10% inflation factor. Reducing the inflation to 6% results in a reduction in expenses of $17,550,000.

(3) Revenue Conversion Factor

My third adjustment reduces Edison's revenue conversion factor from 2.14 to 2.119. The reason for this adjustment is that as Edison's revenues increase, so does the level of investment tax credit utilization and ITC amortization. The

revision from 2.14 to 2.119 reflects an additional amount of ITC amortization as shown on Edison Exhibit 2 Schedule C-1.

(4) Working Capital Adjustment

In Docket 80-0546 Mr. Ron Kozoman of the Accounts and Finance Staff presented a method of determining working capital allowances through:

> "a reconciliation of the financing of respondent's assets, reducing working capital to the extent that it was not being financed by permanent capital."

The Commission accepted this methodology stating:

> "... Staff's analysis of working capital requirements using Edison's balance sheet of December 31, 1980 is appropriate and properly reflects rate base assets financed with permanent capital."

In the instant case, based on 12-month average figures, I have utilized a similar approach which results in a rate base deduction of $51,115,000. The method I employed, with figures provided by Edison's budget staff, can be summarized as follows:

Step 1: Deduct current assets from current liabilities (with the exception of accrued reclamation costs already deducted from rate base)

Step 2: Adjust for 15 days of accounts receivable net of accrued taxes to compensate for unbilled revenues.

Step 3: Remove effects of over/under recoveries resulting from deferred fuel cost accounting.

Step 4: Reduce the adjustment by accounts payable related to non-CWIP rate base (since AFUDC is based on cash construction expenditures).

Step 5: Reduce the adjustment by the net of accounts payable and accounts receivable related to non-consolidated subsidiaries and by customer deposits (due to G. O. 172 these funds how do have a cost to Edison).

The results of these steps are shown on Exhibit AF-2. I have been more conservative than Mr. Kozoman through not considering Accounts Payable related to non-CWIP rate base and dividends payable. I have not, however, made an adjustment for accrued interest on CWIP. This is because Edison's AFUDC rate is based on average instead of beginning of the period embedded debt and preferred rates, and the Company recovers these costs through its AFUDC calculations.

II. Effects of Other Staff Accounting and Financial Testimony

Revenue Requirements

Exhibit AF-2 summarizes income statement and rate base adjustments made by Mr. Gorniak, Mr. Jastrzebski, Mr. Buxton, and myself. Exhibit AF-3 shows the effects of these adjustments combined with an average capital structure on revenue requirements and compares the numbers to Edison's filing. Specifically the exhibit includes:

Schedule 1: Edison's proposed revenues

Schedule 2: Edison's proposal without CWIP included in rate base.

Schedule 3: All Staff adjustments with CWIP included in rate base.

Schedule 4: All Staff adjustments without CWIP included in rate base.

1983 Financial Condition

Forecasts of corporate financial statements depend on many factors and are virtually impossible to predict with one hundred percent accuracy. Based on various assumptions, I will present a variety of different financial projections for the year 1983. Before presenting any results, however, it should be emphasized that the scenarios are based on many parameters over which neither the Commission nor Commonwealth

Edison has any control. My first set of forecasts include:

(1) Base Case: Interim increase; Edison's 2% load increase forecast; 1982 Budget reductions; See other assumptions on Exhibit AF-4;

(2) High Sales Forecast: Based on Mr. Costello's testimony; assumes an increase in GWH sales of 1,456 in 1982 and of 3,082 in 1983.

(3) Low Sales Forecast: Based on Mr. Costello's testimony; assumes a decrease in GWH sales of 1,562 in 1982 and 3,100 in 1983.

(4) Effect of Staff's recommended expense reductions: Assumes Base Case Revenues; 1983 O&M expenses reduced by $74 million; and reduced taxes other than income of $39 million.

Exhibit AF-5 depicts the effects of these varying assumptions on certain financial ratios. The forecasts demonstrate that a slight increase or decrease in load growth has very significant effects on financial statistics. Additionally, the simulations show that given a certain level of revenues, cutting

expenses -- whether by reducing cash outlays or by capitalizing the expense -- can substantially improve the financial condition of Edison. Exhibit AF-5 also shows that Edison's worst financial indicator is pretax coverage of interest expense excluding AFUDC. Finally, although I have compared Edison's coverage ratio including AFUDC to industry averages, the comparison standards are somewhat misleading since this statistic is affected by net of tax vs. gross of tax AFUDC accounting (Illinois Power found in a recent survey that only 5 of 22 AA companies use the net method). Edison's coverage ratio would increase if the company utilized a gross-deferral method of AFUDC accounting.

In the next set of financial forecasts, my objective is to gauge the effects of varying levels of rate awards. Although all of the scenarios assume similar sales and expense levels, the effect of alternate assumptions can be estimated through "shifting" the financial ratio graphs up or down based on the above analysis. The "rate increase" scenarios include:

(1) The Base Case.

(2) Edison's proposed $805.9 million increase; CWIP included in rate base (all other assumptions are similar to base case).

(3) All Staff adjustments; 17.6% ROE; $623.28 million increase. (Note: assumes actual expense levels equivalent to the above two scenarios).

(4) All Staff adjustments; 16.25% ROE (AFUDC rate is also adjusted). $555 million revenue increase.

(5) All Staff adjustments; 17.6% ROE; CWIP deducted from rate base; $510.29 million revenue increase.

Exhibit AF-6 highlights certain very interesting results from these scenarios. With the proposed $805 million increase, Edison's return on equity and dividend payout ratio far exceed A averages while earnings per share jumps to $4.64 -- and this is based on the conservative assumption that Edison reduces no expenses. At the same time the Company's coverage ratio excluding AFUDC remains below A averages even with the full rate increase. Scenarios four and five of Exhibit AF-6 show that the Commission can increase interest coverage excluding AFUDC without increasing profitability ratios by including CWIP in rate base and ordering a lower return on equity. This can also be accomplished by ordering Edison to reduce its debt to capital ratio.

Exhibit AF-7 is intended to demonstrate financial effects of further construction cost overruns as projected by Charles

Komanoff on AG Exhibit 7, Schedule 3 (interim case). To exemplify the impacts of Mr. Komanoff's estimates, I have utilized revenue projections from the base case and simply increased direct construction expenditures. Exhibit AF-7 shows that Mr. Komanoff's aggrandized construction estimates would have a significant effect on many of Edison's financial ratios. However even with these inflated estimates, Edison's financial statistics show pronounced increases after 1983 as more investment tax credit can be utilized and as more of the nuclear units become operations.

III CWIP In Rate Base and Other Construction Issues

(A) INTRODUCTION

The purpose of this section of my testimony is to evaluate certain issues related to Commonwealth Edison's construction program including the Company's proposal to include $546 million of construction work in progress (CWIP) in its rate base. I have already testified in the interim case on the magnitude of Edison's construction program. Exhibit AF-8 updates some statistics presented in the interim case and continues to demonstrate the enormity of the Company's construction program, both in absolute magnitude and relative to the electric utility industry.

In this testimony, I will discuss certain regulatory and economic implications from Edison's huge construction program.

The Illinois Commerce Commission has previously adjudicated requests by Commonwealth Edison Company for CWIP to be included as part of the company's rate base. In Edison's last rate case (Docket #80-0546) as well as in various dockets for other utility companies the Commission has stated:

> "Inclusion of CWIP in rate base is appropriate where the CWIP investment has become so great that it could impair financing."

Given this general policy, I will attempt to shed additional light on the CWIP issue and recommend that the Commission adopt a Staff alternative to "Standard" CWIP in Rate base that addresses some of the inherent weaknesses in the current CWIP methodology.

<u>Criteria and Methods for Evaluating Construction Issues</u>

Notwithstanding the emotional debates over Edison's Nuclear Construction Program, I will attempt to objectively analyze

various issues related to Edison's construction program through utilizing several economic simulation models. In order to accomplish such analysis, the first step is to establish a set of criterion as a basis for evaluation. Five such criteria in judging alternative methods of financing and accounting for the construction of Edison's 6 units are:

(1) The cost of each alternative:

The cost to ratepayers of various regulatory policies is generally deemed highly important by state public utility commissions, including the Illinois Commerce Commission. My testimony will demonstrate that certain comparative cost analysis of CWIP in rate base vs. AFUDC, predicated upon non-utility specific assumptions, is unsophisticated and potentially misleading. Present value analysis based on an integrated company specific model, however, is much more useful.

(2) The equity of each alternative (from an intergenerational standpoint):

Equity questions of "subsidies" across various "generations" of ratepayers are basic to many (if

not all) regulatory issues, including AFUDC vs. CWIP. Unfortunately, this important and complex criteria has generally been described in legal terms ("currently used and useful") and trite expressions ("forced investment") which are inappropriate or inflamatory. My testimony will demonstrate that, due to a radically changed economic environment confronting Commonwealth Edison (and the whole electric utility industry), a new set of axioms is more appropriate in judging equity considerations related to construction issues.

(3) The effects of each alternative on financial integrity:

The Illinois Commerce Commission has a fundamental responsibility to establish rates which are "fair and reasonable". This responsibility requires the Commission to attempt to maintain the financial integrity of a utility company over time.
In debates on CWIP in rate base, short-term financial ratios are frequently emphasized by utility companies who highlight effects on their cost of capital. Although not using financial integrity as the sole basis for determining the merits of CWIP in rate base, my testimony will consider effects of various regulatory policies on specific financial ratios -- both in the short and long run.

(4) The effects of each alternative on accountin

Due to the uniqueness of AFUDC accounting to utility industries, many accounting theorists objected to abandoning the AFUDC methodology mony will argue, however, that AFUDC account correctly reflect the cost of assets and tha of asset costs must not be taken lightly in intensive regulated industry. Given the cur environment surrounding electric utility com however, complex questions of who should bea financing costs for large construction proje lengthy lead times cannot be answered solel accounting cost allocation procedures. The cannot control the substance.

(5) Other criteria:

Many other criteria have been used to eva rate base including various alleged effe efficiency and incentives. I will brief some of these issues.

In evaluating issues related to Edison's construc with respect to these criterion my testimony emp different economic simulation models. These inc

(1) Incremental analysis focusing on CWIP in rate base.

(2) Corporate Finance Simulation Models.

(3) "One Asset" models.

(4) Dynamic "full cycle" simulation models.

Conclusions With Respect to CWIP in Rate Base

My conclusions regarding CWIP in rate base compared with AFUDC and a Staff proposal for a "Restoration of Capitol Costs" plan (ROCC)*, can be summarized as follows:

(1) Intergenerational equity questions are central to regulatory policy issues related to Edison's construction program and must not be lightly dismissed. Both CWIP in rate base and AFUDC, however, yield highly imperfect results in terms of optimal allocation of resources between various generations of customers. Staff's proposal will minimize the "pay before you use" issue while providing a more appropriate capitol recovery stream over the plant's life.

(2) Because of additional cost which could result to the ratepayer from Edison being unable to complete its

*Note: I will occasionally refer to the proposal as the "Capital Investment Recovery Illinois Model" (CIRIM). The terms ROCC and CIRIM can be used interchangeable.

construction program in a timely and cost effective manner if the Company's financial integrity is in jeopardy, the Commission should continue to carefully monitor Edison's financial ratios. Traditional adjustments to rate of return or attrition allowances, however, are not least cost mechanisms for affecting many of these ratios. Policies of allowing Commonwealth Edison to recover certain construction costs as cash during heavy financing periods (or possibly adjusting capital structure), on the other hand, do produce advantageous results from the point of view of ratepayers. The Staff proposal accomplishes this result in a more efficient manner than other alternatives.

(3) The cost of the alternate regulatory policies is not equivalent and the magnitude of cost variances differs for different groups of ratepayers. Although present value analysis is quite subjective, policies of allowing Edison adequate cash flows through current recovery of construction costs while at the same time allowing lower rates of return on equity or lower AFUDC rates to reflect reduced financial risk, are the least costly alternatives to ratepayers and Commonwealth Edison Company.

(4) The "standard" policy of including CWIP in rate base fails to properly reflect the cost of Edison's assets over time. Although in the short-term this might not appear worrisome, over the long run the resultant lower depreciation cash flows and distorted prices may be very dysfunctional. The Staff proposal more properly reflects the plant's cost over time.

(5) The Staff proposal to include certain accumulated construction costs in rate base but symetrically remove equal amounts once plants become operational provides an optimal solution to many of the problems inherent in either the CWIP in rate base or AFUDC policies.

(B) ACCOUNTING PROCEDURES OF AFUDC, CWIP IN RATE BASE, AND STAFF'S ROCC PROPOSAL.

Before beginning my analysis through economic modeling, I will briefly recap accounting methods of servicing construction investments through allowance for funds used during construction, CWIP in rate base, and Staff's restoration of capital cost proposal.

Allowance For Funds Used During Construction

The Commission's uniform system of accounts defines AFUDC as

"the net cost of all funds used for construction purposes during the period of construction". This accounting procedure derives an AFUDC rate based on the approximate overall net of tax cost of capital and applies the rate to cash invested in construction. Once the amount of AFUDC has been determined, it is added to "direct" construction costs and, simultaneously, credited to income in each accounting period. The credited income is eventually recovered as cash through future depreciation charges (which are higher than if the AFUDC had not been capitalized) and pending this recovery the "undepreciated" AFUDC is included in rate base. Simply stated, the AFUDC accounting procedure treats financing costs in a comparable manner to any other construction costs. Since the costs of financing a plant during construction are just as real as the cost of "bricks and mortar", AFUDC accounting serves to correctly state the cost of a company's assets. The analogy of a firm purchasing instead of constructing an asset illustrates this point. If Company A would purchase an asset from Company B instead of building the asset itself, without question the purchase price of the asset would reflect B's financing costs as well as the direct construction costs.

Due to dramatically changed circumstances in the electric utility industry including longer lead times for completion of construction projects, radically increased costs of money,

and substantially more pronounced inflation, AFUDC accounting no longer is efficient in many respects. The real issue today, therefore, is not the accounting propriety of AFUDC; it is a technically correct accounting procedure. Neither is the issue whether ratepayers will or will not pay the utilities carrying cost of capital for a plant under construction. All costs associated with a plant are eventually paid by consumers, at least in theory. The basic question is how and when ratepayers should pay the carrying cost of capital. In this regard the capitalization of AFUDC has the following effects in the environment confronting electric utilities in general and Commonwealth Edison in particular:

(1) AFUDC generally fails to provide sufficient cash earnings for utilities with major construction budgets to meet financing requirements without reducing financial integrity in a significant manner during such construction.

(2) AFUDC generally does a poor job of providing ratepayers with adequate price signals over time (as will be discussed below).

CWIP Included in Rate Base

In most non-capital intensive non-regulated industries AFUDC is

not an accepted practice. Yet this must not be interpreted to imply that the major suggested alternative to AFUDC, CWIP in rate base, is a theoretically correct accounting practice in the utility industry. Due to the capital intensity of the electric utility industry and because of the extensive use of accounting information by the regulatory agencies, correct cost reflection of assets is vitally important. On the other hand, although the regulatory policy of including CWIP in rate base distorts the cost of assets (downward) from an accounting standpoint, the mechanism does provide improved financial integrity during periods of heavy reliance on externally generated funds and it does provide improved price signals as compared with AFUDC during periods of inflation and increasing costs of capital. Given various assumptions, CWIP may also be less costly than AFUDC to ratepayers on a present value basis.

By distorting the cost of assets, however, the CWIP in rate base policy can come back to haunt the utility company, ratepayers, and regulatory agencies. Once a plant, portions of which had been included as CWIP in rate base, becomes operational, cash flow and utility prices are lower than if CWIP had not been included in rate base. Hence, when the utility company engages in building the next "round" of plant, financial integrity and then current price signals are worse than they would have been

had CWIP not been included in rate base. During this "second round", either the company must ask for (and receive) higher percentages of CWIP in rate base than was requested during the "first round" or the CWIP in rate base associated with the "first round" has simply compounded financial and pricing problems during the "second round".

Staff's Restoration of Capital Cost Plan

Maintenance of Edison's financial integrity in the face of the Company's huge construction program is essential; in the last main rate case, the last two interim cases, and in Phase I of the construction case, the Commission has recognized that timely and cost effective completion of Edison's generating plant construction projects is in the best interest of ratepayers. To help Edison maintain the financial integrity necessary to achieve this goal the Commission has allowed $343 million and $748 million of CWIP in rate base in Dockets #79-0214 and #80-0546 and has allowed substantial interim rate relief in Dockets #80-0546 and #82-0026.

Due to this inclusion of CWIP in rate base, ratepayers are experiencing somewhat higher prices than otherwise during the construction period of Edison's six nuclear units and they will see somewhat lower prices throughout the life of the plants than if no CWIP were included in rate base. I will

refer to the lowered rates throughout the the life of the plant as the CWIP in rate base "payback period". My analysis will demonstrate that there is no theoretical basis for extending this "payback period" over the life of the plants associated with CWIP in rate base; to the contrary, a far more accelerated "payback period" yields superior results in a number of respects The proposal submitted today removes amounts of CWIP previously allowed in rate base and "restores" AFUDC once plants become operational.

Specifically, the ROCC plan involves the following key points:

- Any CWIP allowed in rate base during construction should be removed from rate base once plants become operational. In other words, if Edison has been granted $343 million, $708 million, and $525 million of CWIP in rate base before its round of nuclear plants become operational, $525 million, $708 million and $343 million should be removed once Edison's current "round" of plants come on line.

- The "negative CWIP" amounts described above should be removed from rate base for periods corresponding to the length of time that CWIP was originally included in rate base during construction.

- While amounts are excluded from rate base AFUDC should be "restored" on such amounts.

- After the "negative CWIP" has been removed from rate base, for the appropriate length of time, the rate base should be increased by both the "negative CWIP" and the "restored" AFUDC. The plant is then depreciated in the normal manner for the rest of its useful life.

- As a check that the ROCC mechanism is functioning properly, Edison should be directed to record, as memorandum accounting entries, "forgone AFUDC on CWIP in rate base". When all of the CWIP is finally restored to rate base, the cost of Edison's plants should correspond to the cost had CWIP never been included in rate base (in other words, if AFUDC had been used exclusively).

- As will be discussed subsequently, the exact timing of the ROCC plan is dependent on a utility's financial integrity and price signals. However, this is not clear cut in the case of Commonwealth Edison due to the fact that the company is building six nuclear plants concurrently. Based on my current forecasts, I would suggest the following:

(1) Allow a certain amount of CWIP in rate base in this case -- this can be more or less than what Edison has requested and should reflect cash flows sufficient for financial integrity and an equity (and/or AFUDC) reflecting such decreased risk.

(2) In the next rate case, when LaSalle #2 and Byron #1 should come into service, do not allow any CWIP in rate base.

(3) In the case where Byron #2 comes into service, begin deducting previously allowed CWIP from rate base and restoring AFUDC.

The improved regulatory efficiency from the CIRIM proposal is particularly evident in the case of Commonwealth Edison Company. Due to this utility's large nuclear construction program, which has occurred during periods of particularly tight credit, the pressure on financial integrity, and the resulting sudden price increases are very severe and require regulatory creativity.

(C) EVALUATION OF INTERGENERATIONAL EQUITY QUESTIONS USING DYNAMIC "FULL CYCLE" MODELS

At any point in time a utility company will have numerous

assets of different vintages on its balance sheet. Hence isolating on a single asset in studying effects of various issues on the financial development of a firm over time can be misleading. In analyzing the issue of flow-through vs. normalization of book/tax timing differences, dynamic "full cycle" models have proven to be the more appropriate analytical tool. The use of these continual growth models can yield equally beneficial results in evaluating economic issues surrounding Edison's construction program. In studies of interperiod tax allocation policies, the simulation models generally assume:

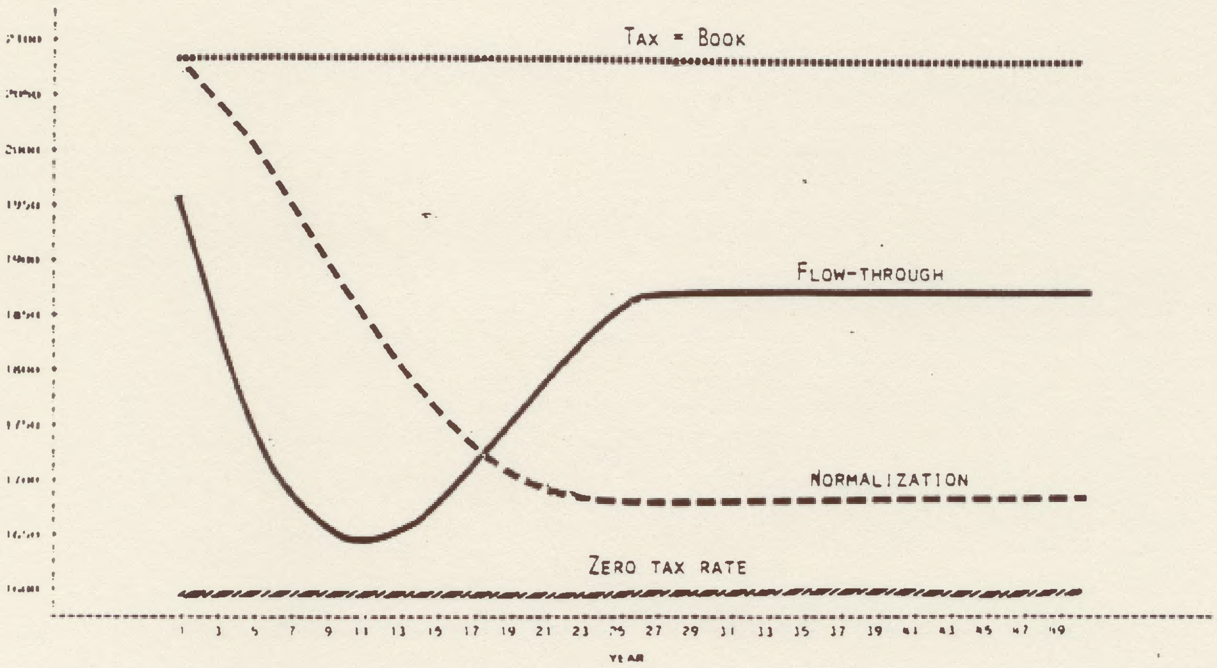
- Constant growth in sales which is equivalent to the growth rate in assets.
- Constant costs of capital and growth rates.
- No lead time in construction projects.
- No operating expenses.

Obviously, the assumptions are hypothetical. In no way, however, does this impede the value of the analysis. First of all, the models are intended only to be analytical devices; even though the assumptions are hypothetical, the results can be very instructive in highlighting the dynamic economic effects of alternate regulatory treatments. Secondly, the effects of changing any of the assumptions

can quite easily be studied through sensitivity analysis.

Studies of flow-through vs. normalization have yielded the following per unit capital cost functions through time based on interperiod tax allocation policies:

Figure #1 Per Unit Capital Costs of Flow-through vs. Normalization



The graphs, of course, are affected by different assumed growth rates, costs of capital, capital structures, tax rates and other parameters. Sensitivity studies have in fact been performed studying many such issues.[1] Whatever assumptions are used, however, an important result is convergence about an equilibrium price once the plants have gone through their "life cycle". Given assumptions of constant growth and no inflation this result is intuitively appealing as well as mathematically correct; after all, if price did not converge, it would, by definition, eventually have to approach either positive or negative infinity.

To study questions related to the construction program of Edison, I will start with the function labeled "tax = book" on Figure #1 as a base case.[2] Beginning with this scenario I will subsequently analyze effects of:

- Varying Construction Lead Times.
- AFUDC vs. CWIP in Rate Base vs. Staff's Proposal.
- Increasing costs of capital.

[1] For example, the higher the growth rate, the lower the flow-through rates compared to normalization. See Donald W. Kiefer, "Accelerated Tax Depreciation and The Investment Tax Credit in The Public Utility Industry: A Background and Analysis."

[2] Although it would be easy to analyze the regulatory effects of accelerated tax depreciation and flow through vs. normalization in conjunction with issues related to Edison's construction program, this would serve to complicate the analysis without providing much analytical enhancement.

Varying Construction Lead Times

In the electric utility industry, generating plants being very capital intensive are obviously not placed into service during each accounting period. This phenomena of "lumpiness" has recently become more pronounced for Edison and will be even more dramatic in the years ahead. The increase in "lumpiness" can be easily explained by reviewing a few major changes to the economic environment of Commonwealth Edison Company over the past decade. These occurrences include:

- Declining load growth
- Increased capital intensity of generating plants
- More stringent environmental regulations
- More pronounced inflation

Declining load growth has lessened the need for generating stations which, given a comparable level of capital intensity, increases the time period between which additional capacity is required. Furthermore, rapid inflation has led to reluctance on the part of companies to replace aged plants (no longer are economies of a new plant sufficient to offset the "inflated" capital costs). Finally, changing technology and more stringent environmental regulations

have directly led to even more capital intensive plants and even longer construction lead times. The more pronounced "lumpiness" of capital additions resulting from all of these factors has very important regulatory implications. I will consider some of these by using a dynamic simulation model.

To model varying lead times, I have utilized similar full cycle models to those used in Figure #1, removing the assumption of no "lumpiness" in capital additions. Mathematically, when no construction lead time is assumed:

Direct construction costs = Direct plant in service =

$$C_o(1+g)^t$$

(where C_o represents construction expenditures in the first year of the study)

If construction lead time equals n years,[3] then:

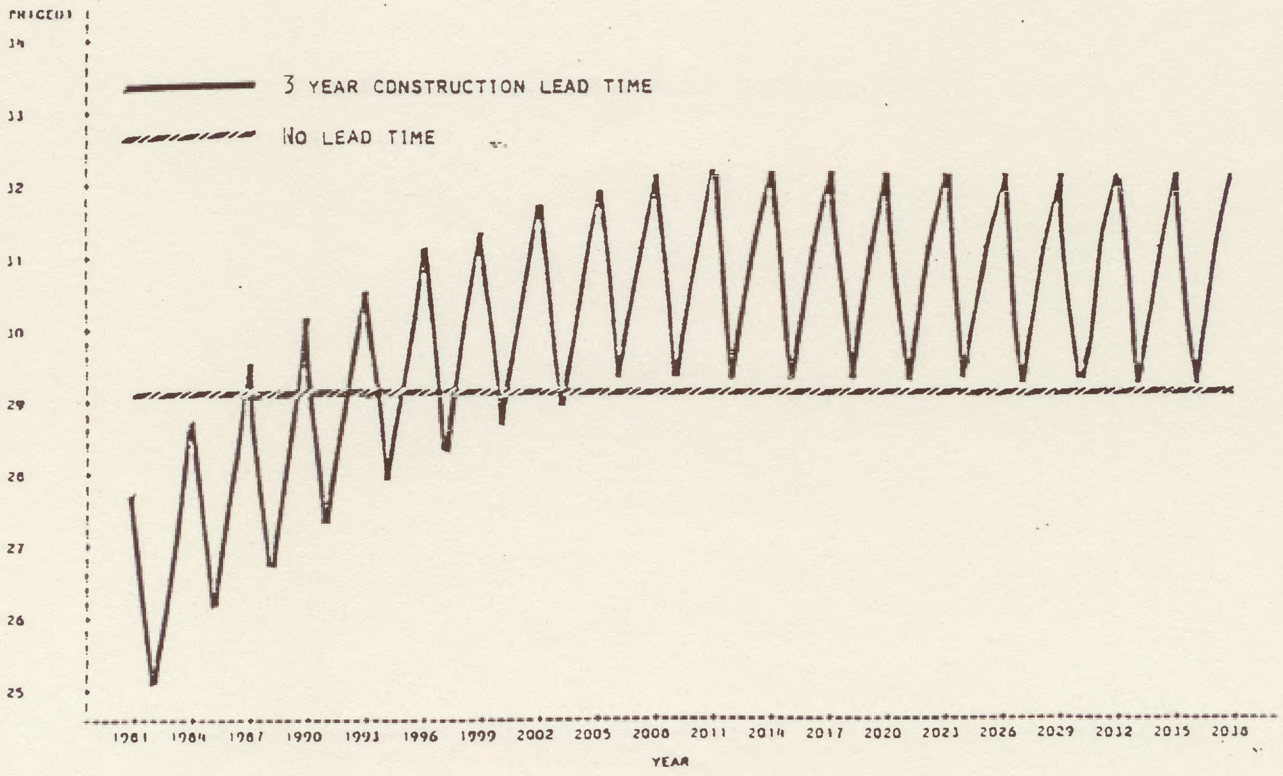
$$\text{Direct plant in service} = \sum_{i=t}^{t+n} C_o(1+g)^i.$$

[3] Although construction projects in fact follow "S" shaped curves while the above equation assumes an exponential shape, the analysis would not be materially affected by assuming alternate construction profiles.

Dynamic Simulation of AFUDC Accounting

As soon as lead times are introduced, capital is tied up in the construction projects, and servicing the carrying cost of this capital. In the electric utility industry the capital financing construction has been historically serviced through AFUDC accounting. Utilizing a 3 year construction period and AFUDC accounting, the following pattern of prices through time results as compared to the base case:

FIGURE #2 PER UNIT CAPITAL COSTS OF 3 YEAR CONSTRUCTION LEAD TIME VS. NO LEAD TIME



Three important conclusions can be derived from this graph:

(1) When construction lead time is introduced, price never stabilizes at a set of equilibrium points; rather price appears to achieve an "oscilating equilibrium" condition.

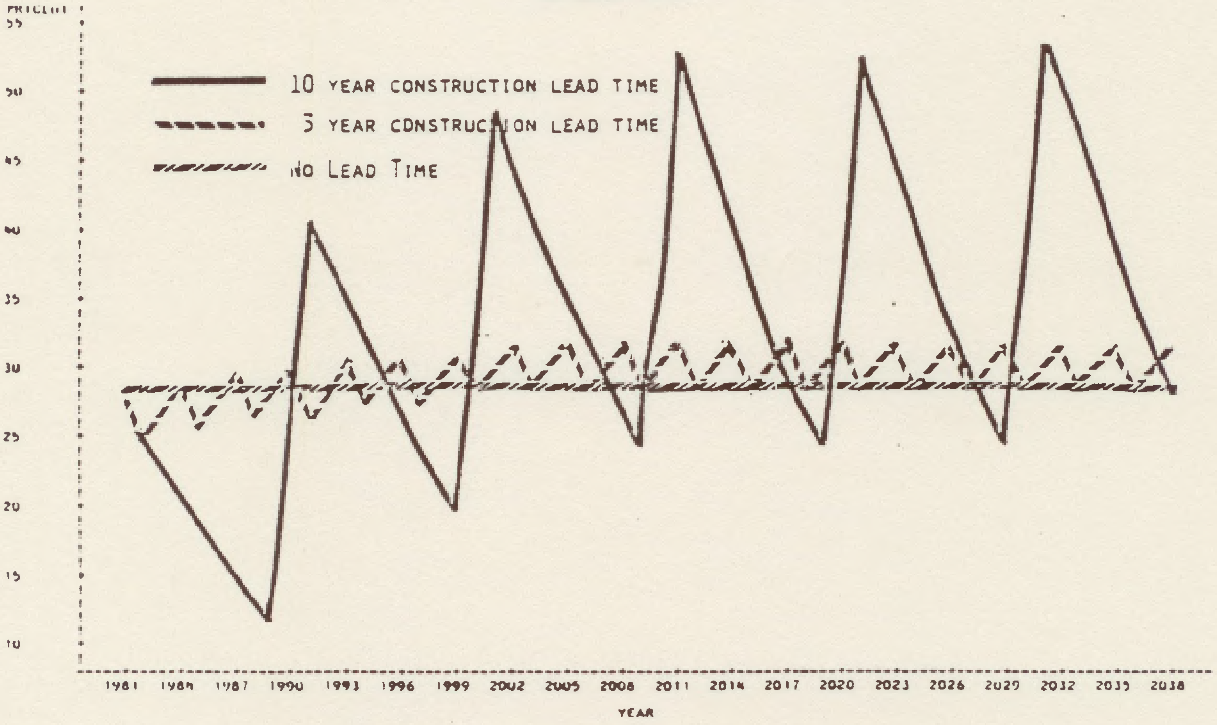
(2) The "oscilating equilibrium" condition described above produces a per unit capital cost higher than the equilibrium price without construction lead times. This logical result is explained by the fact that financing costs during construction are very real costs which must be incurred at one time or another.

(3) Under perfect competition price would converge to an "imaginary" smooth line about which the AFUDC line oscilates and does not fluctuate as is reflected in Figure #2. This "smooth" competitive line furthermore would yield economically superior results to the AFUDC prices.

In order to exemplify the conclusion in point number three above, as well as to reaffirm the first two, I

will Simulate a 10-year instead of 3-year construction lead time scenario. Now the oscilations about the "imaginary" equilibrium line are more pronounced and the ratepayers "have a rougher roller coaster ride":

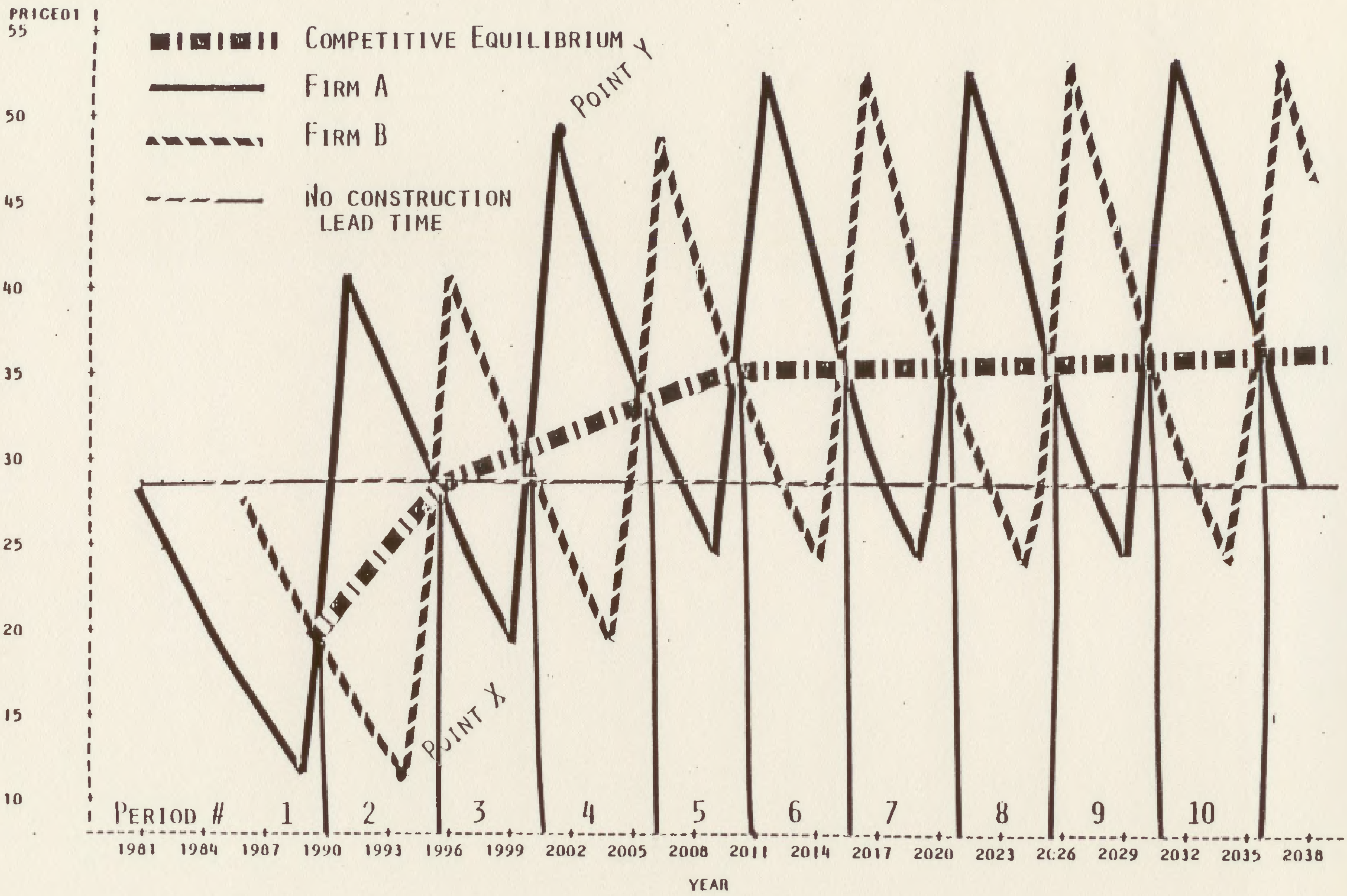
FIGURE #3 PER UNIT CAPITAL COSTS OF 10 YEAR CONSTRUCTION LEAD TIME VS.
3 YEAR CONSTRUCTION LEAD TIME VS.
NO LEAD TIME



Note in Figure #3 that the 10 year lead time scenario reaches an oscilating equilibrium condition above that of the 3-year lead time graph. This is easily explained by the fact that more financing is necessary to service the longer lead time of the construction project. The costs of this additional financing again must be incurred at one time or another by ratepayers.

The fact that competition would "smooth out" prices through time can be illustrated by considering an anology of a two company industry where the two firms are continually replacing assets as reflected in the 10 year lead time model. Firm A however is 5 years ahead of Firm B in its construction profile. If both firms employed AFUDC accounting and set prices accordingly, the following would result:

Figure #4 Competitive Equilibrium Per Unit Capital Costs



If the price structure reflected in Figure #4 existed in a competitive industry, Firm A would obtain all of the sales in periods 1, 3, 5, 7, and 9 while firm B would receive all of the sales in periods 2, 4, 6, 8 and 10. These dramatic demand shifts between the two firms would result simply because the two companies have different vintages of plant on their balance sheets. Clearly a much more realistic and stable situation would be where Firm A charges higher prices than its AFUDC line in periods 1, 3, 5, 7, and 9 and lower prices than its AFUDC line in periods 2, 4, 6, 8, and 10. The converse would be true for Firm B. This alternate price structure would tend to "smooth out" rates through time as reflected in the line marked "competitive equilibrium".[4]

A basic tenet of economic theory is that competitive prices produce an optimal allocation of resources. Since the Illinois Commerce Commission is in many respects a substitute for competition, this competitive model has been applied to many areas of regulation including cost of capital, marginal cost pricing, and flow-through vs. normalized accounting. The advantages of a competitive model are readily apparent in analyzing Figure #4. If a customer is at point X or Y on this chart, he will make purchases (an electric instead of a gas stove or vice versa) based on totally inappropriate price signals.

4 If both firms charged prices as reflected on the competitive equilibrium line, their net income would fluctuate according to their construction profiles. During periods where CWIP balances are high the firms would earn more than their cost of capital while the converse would be true in other periods.

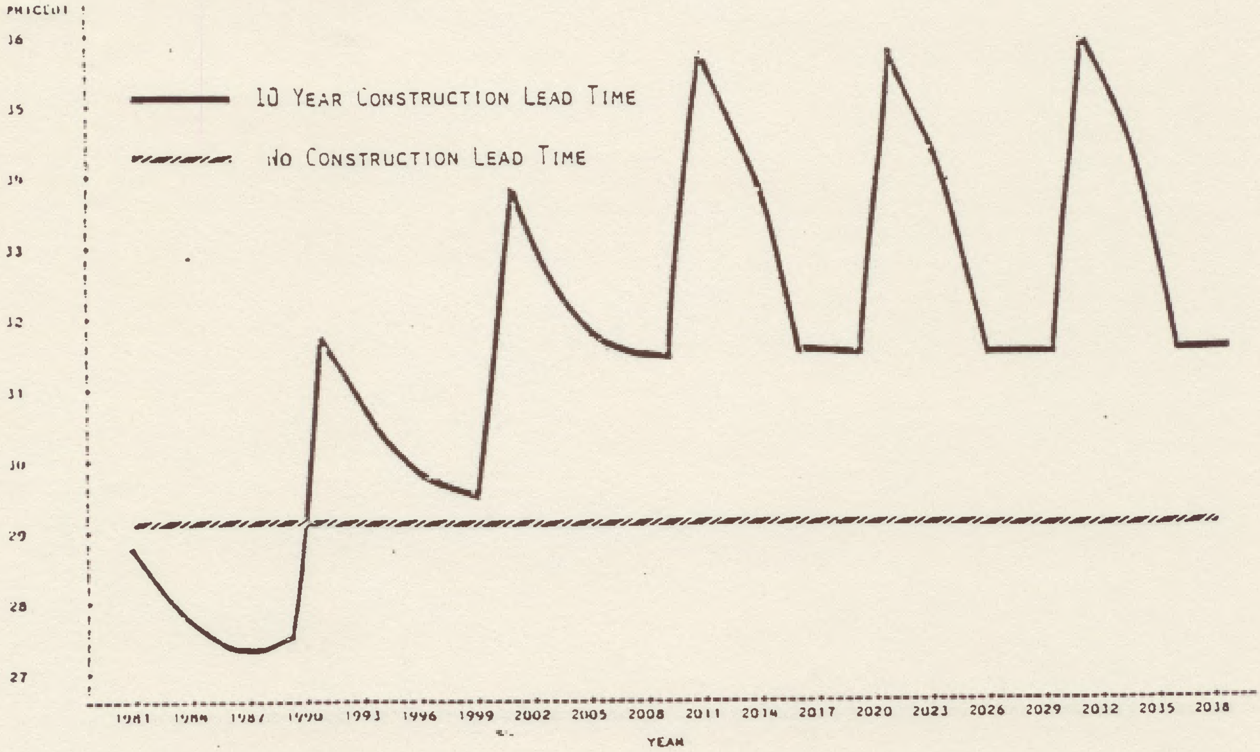
Inefficient purchases such as these create further distortive "ripples" throughout the economy.

The above analysis puts principles of "used and useful" and "forced investment" in a totally different hue. Dynamic economic modeling demonstrates that in certain situations where construction programs are extremely large the oscilating prices resulting from utilization of AFUDC accounting can be economically inefficient and potentially unfair to certain "generations" of customers. The analysis shows that the closer rates conform to the competitive "smooth" line of Figure #4, the more optimal the prices in all time periods. In this perspective, AFUDC is highly inequitable from an intergenerational standpoint and AFUDC accounting produces very uneconomic price signals.

Dynamic Simulation of CWIP in Rate Base

An obvious question arising from the above analysis is what are the economic effects of including CWIP in Rate Base. To help answer this question I have utilized the 10-year construction lead time scenario and included 100% of CWIP in the rate base. Such a scenario produces the following graph:

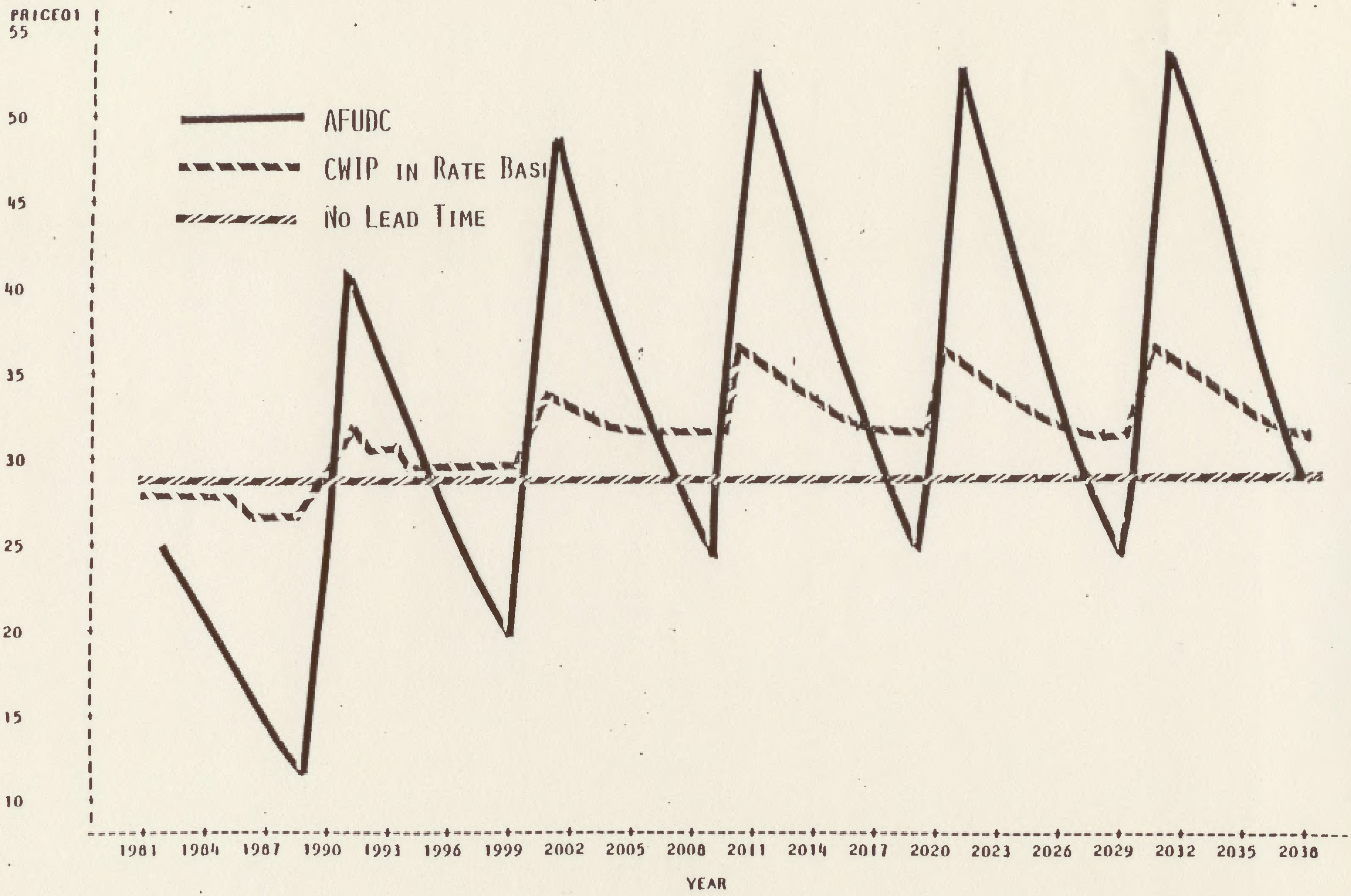
Figure #5 Per Unit Capital Costs of 100% CWIP in Rate Base: 10 Year Construction Lead Time



As was the case with AFUDC, CWIP in Rate Base results in prices achieving an "oscilating equilibrium" condition above that of the no-lead time scenario. Although per unit capital cost in the 100% CWIP graph never dips below the no lead time function, the CWIP in rate base prices remain very jagged and economically un-optimal.

Juxtaposing AFUDC rates with the CWIP in rate base curve further exemplifies certain conclusions:

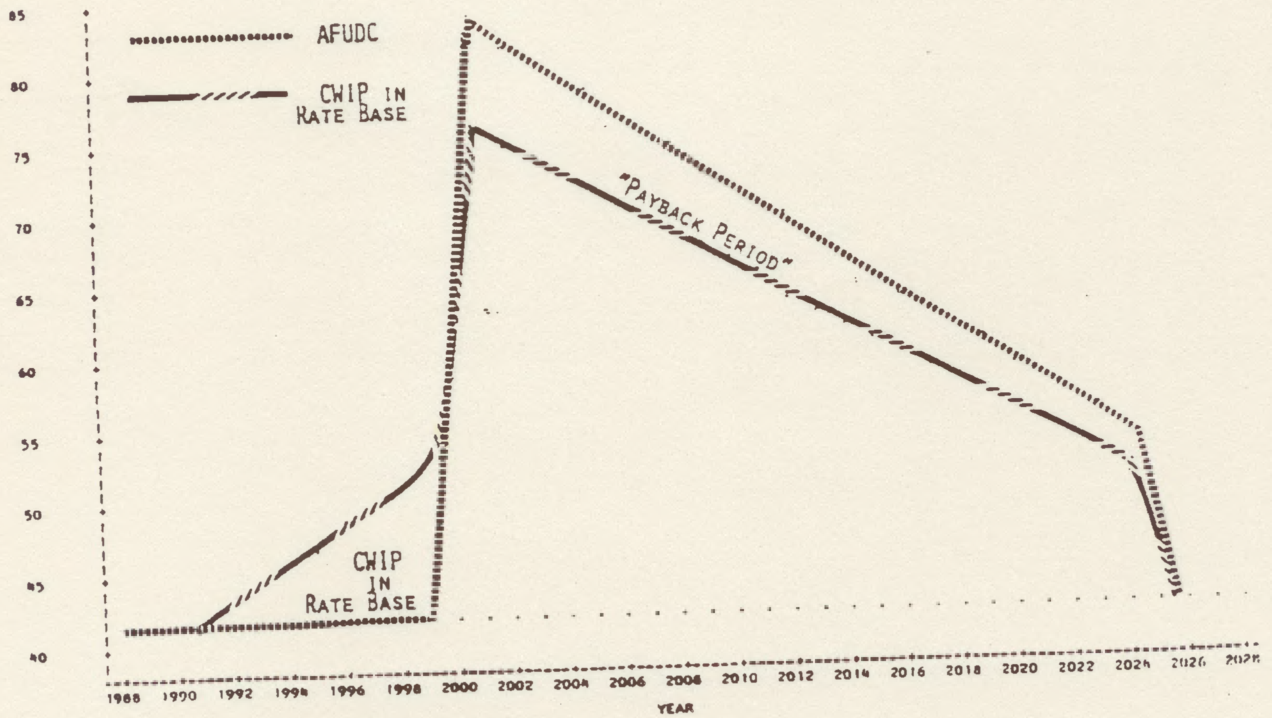
FIGURE #6 PER UNIT CAPITAL COSTS OF CWIP IN RATE BASE VS. AFUDC



(3) The effects of operating efficiencies can be demonstrated in this type of model.

Using a one asset/no growth model,[5] 50% of CWIP in rate base vs. AFUDC produces the following graph:

FIGURE #7 ONE ASSET/NO GROWTH MODEL
CWIP vs. AFUDC



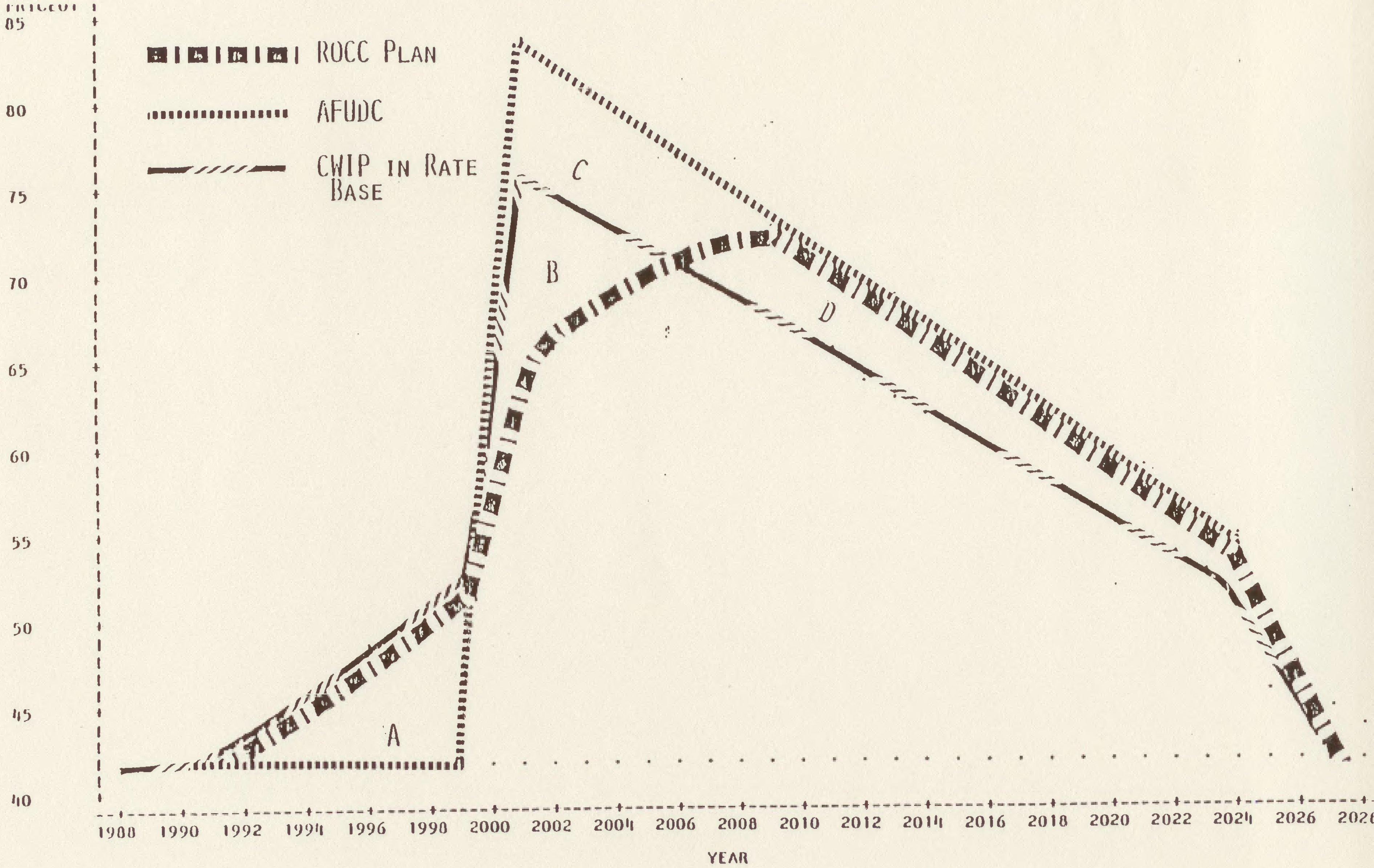
[5] In this model one plant is constructed and not replaced.

An immediate observation from Figure #7 is that CWIP in rate base tends to reduce the intensity of the peak in rates when the plant is put into service. This is consistent with our previous discussion and Figure #6. Another result is that in terms of present value (discounted at the utility's net of tax cost of capital) the area marked "CWIP in rate base" is equivalent to the area labeled "payback period". Finally, it should be noted that if operating efficiencies are associated with the new plant both the AFUDC and the CWIP in rate base graphs "shift down" by an equal amount once this plant becomes operational. This "shift", however, does not alter the general shape of the graphs.

Figure 8 compares Staff's CIRIM proposal with both CWIP in rate base and AFUDC accounting.[6] It is apparent that prices under the Staff proposal originally conform to the rates which exist from a CWIP in rate base policy. However, once the plant becomes operational, Staff's proposal yields lower rates than either CWIP in rate base or AFUDC. The prices remain lower than the rates which would have existed under AFUDC for a period of time equivalent to

[6] The AFUDC computations are shown on Exhibit AF-9. It can be seen that the ROCC proposal can be interpreted to allow positive CWIP in rate base during the construction period and "negative CWIP" once the plants are placed into service. Furthermore, when the CWIP in rate base is "negative", AFUDC is restored and subsequently included in rate base.

FIGURE #8 ONE ASSET/NO GROWTH MODEL
CWIP vs. AFUDC vs. ROCC



the length of time CWIP was included in rate base. Finally, in the latter part of a plant's life, rates under the CIRIM plan are what they would be under an AFUDC policy.

In terms of incremental present value, Staff's proposal theoretically yields equivalent results to either CWIP in rate base or AFUDC in the one asset model. This can be interpreted in Figure #8 to suggest that the discounted cumulative revenues represented by the area underneath the three curves are equivalent. In other words, the present value of area A is equivalent to B plus C -- CIRIM is equivalent to AFUDC. Similarly, the discounted area of B is equivalent to D -- Staff's proposal also produces comparable costs to CWIP in rate base.

The principal effect of the CIRIM proposal is thus removing the sharp peak in rates that exists when plants become operational under either CWIP in rate base or AFUDC accounting. This smoothing of rates is very economically efficient and equitable as discussed previously. In fact it should be readily apparent that if a company is continually building plants, as our earlier model assumes, the rates produced from the Staff proposal would conform to those shown on

the "competitive equilibrium" line on Figure 4.

Effects of higher costs of capital

In a dynamic simulation increases in cost of capital will have two principle effects:

(1) The per unit capital costs increase and

(2) The fluctuations in the AFUDC and CWIP in rate base scenarios become more pronounced.

(D) EVALUATION OF THE COST OF VARIOUS ALTERNATIVES USING INCREMENTAL AND CORPORATE MODELS

In debates over the regulatory policies of CWIP in rate base versus AFUDC, the amount of "savings" to ratepayers is central to arguments of the various proponents. Since the value of a dollar tomorrow is less than its value today, these "savings" are measured in terms of the discounted present value of future revenue requirement streams. Methodologies of isolating on one constant discount rate applied over a single time frame to incremental revenue requirements produced by either CWIP or AFUDC, however, can be very deceptive.

I will discuss the following five problems with "traditional" present value analysis as it relates to CWIP in Rate base vs. AFUDC:

(1) The problem of determining whether present value analysis is necessary in the first place.

(2) The problem of determining the appropriate relationship between consumer discount rates and the utility's cost of capital.

(3) The problem of unstable costs of capital.

(4) The time frame problem of determining over what period the present value analysis should be performed.

(5) The problem of applying the present value analysis to appropriate analytical models.

After discussing these problems I will conclude:

(1) In studying CWIP vs. AFUDC, there is little basis for asserting that the consumer discount rate is exactly equivalent to a utility's net of tax cost of capital.[7]

(2) Certain types of present value studies are of a limited value in evaluating CWIP vs. AFUDC due to ambiguity surrounding the appropriate

[7] CWIP issues differ from engineering/economic studies where clearly the utility's cost of capital is appropriate.

discount rates, time frames, variability of certain parameters through time, and appropriate analytical frameworks.

(3) Staff's CIRIM proposal is advantageous in that it accelerates break even points in "proper" present value analysis.

(4) Staff's proposal to key CWIP in rate base or the CIRIM plan to lower AFUDC rates or low-end ranges of rate of return assures present value savings of these policies.

Is Present Value an Appropriate Criterion?

Clearly public utility commissions should always be concerned about costs of their policies to ratepayers. However in many, if not most, cases, the lowest cost alternative is equivalent to that alternative which yields the most economically efficient results in terms of avoiding cross-subsidies and providing optimal price signals. The appropriateness of present value studies depend on the problem addressed. In determining what depreciation rate is appropriate in allocating the costs of fixed assets through time, for example, it is possible to "prove" under

certain conditions that charging off the full cost of the asset in either the first or the last year of its life would be advantageous in terms of present value. When considering all of the cash flow, equity, accounting, and financial aspects of depreciation theory, however, it soon becomes obvious that present value studies are quite unnecessary.

The case is similar in evaluating flow-through vs. normalization, rate of return, and rate structure issues. Furthermore, in situations where present value may be useful, it must not be the sole criterion for evaluation. For instance when studying whether to build a highly capital intensive plant versus a less capital intensive generating station, the present value of incremental revenue requirements should be only one (although perhaps the major) of a group of criterion which might include financial flexibility, environmental concerns, and many other considerations.

CWIP in rate base is an issue where, due to the discretion of the commission, present value considerations may be relevant. These cost estimates, however, should not totally overshadow evaluations of equity, financial integrity, and various other pricing considerations.

Determination of the Appropriate Discount Rate(s)

Determination of discount rates is a central and often hotly debated facet of any present value analysis. In the instant case an inappropriately low discount rate will suggest CWIP in rate base is cheaper than AFUDC while high discount rates imply the converse. In the past, some have used incremental analysis, which ignores semi-annual compounding of AFUDC, investment tax credit utilization effects, property taxes, invested capital taxes, revenue taxes, regulatory lag, and effects on cost of capital; these flawed models demonstrate that a consumer's rate of return over the life of a plant from including CWIP in rate base is equivalent to the utility's net of tax cost of capital. Exhibit AF-10 demonstrates this as a mathematical equivalance. Although from the utilities perspective their cost of capital may be appropriate in evaluating CWIP in rate base, the assertion that this weighted average net of tax discount rate is appropriate from the point of view of all ratepayers is absurd.

First of all, it must be noted that the concept of rate of return on an investment is very different from the concept

of cost of capital. Net present value analysis suggests that investments should be made where the rate of return on the investment exceeds the cost of capital for that particular investment. Simply because a ratepayer's rate of return on CWIP invested in rate base may under certain assumptions be equivalent to the utilities cost of capital in no way implies that the cost of capital for a ratepayers' CWIP investment is equivalent to the cost of capital of the utility company.

It becomes apparent that the consumer discount rate may differ from the utility's cost of capital by considering the analogy of a person who:

(1) Is a customer of Commonwealth Edison Company,
(2) Has recently bought Edison Commercial Paper, and
(3) Has recently purchased shares of Edison's Stock.

Perhaps this person conceived more risk and less liquidity in purchasing the shares of stock than in the commercial paper -- he would then expect a higher rate of return on the stock purchase than on the commercial paper; his discount rate (or cost of capital) would be higher for the shares of stock than for the commercial paper. Similarly, the person probably has a very different discount rate for the timing

of his electric bills through time as compared to either the stock or commercial paper. His discount rate would again depend on the risks inherent in the "investment", liquidity considerations and other factors such as the term of the "investment". I will not attempt to explicitly analyze any of these aspects of the cost of capital related to such ratepayer "investments", suffice it to say that, due to different qualities of the "investment", the discount rate for evaluating the inclusion of CWIP in rate base can be very different from the utility's overall net of tax cost of capital.

The discount rate for inclusion of CWIP in rate base may additionally be different for different groups of customers. Due to market imperfections such as "regulation Q" for certain groups of customers and because certain ratepayers may be net-savers while others are net-debtors, opportunity costs of capital can very for different groups of customers. Donald Kiefer noted in his analysis of flow-through vs. normalization:

"But what is the appropriate consumer discount rate to use in such an evaluation? One suggestion might be the interest rate which consumers would typically be expected to earn on savings. This would be a relatively low interest rate and in many cases would lead to the conclusion that normalization treatment yields the stream of utility rates with the lowest present value. On the other hand, since most consumers would

be expected to be net debtors, an average interest rate on consumer borrowing may be a more appropriate discount rate. This would be a relatively high interest rate and would most often produce the result that flow through treatment yields lower utility rates in present value terms.... Thus, the first problem with present value analysis of the relationship between utility rates under normalization and flow through is that the evaluation depends heavily on the consumer discount rate, but the appropriate rate to use in such an analysis is to some extent judgmental."

Finally, the discount rate should be adjusted in one way or another to take account of the fact that interest is a tax deductible expense to consumers. If, for example, the assumption is made that a consumer will have a lower downpayment and higher subsequent mortgage payments on a house because of the inclusion of CWIP in rate base, recognition should be made that these mortgage payments are tax deductible (as would the interest on a savings account represent taxable income if consumer funds are invested). Because of the tax deductibility of interest and the fact that tax rates differ for different groups of customers (as well as the utility company), discount rates differ from alternate groups of customers simply because of income taxes. More specifically as the income tax rate increases, the consumer discount rate decreases.

Given these problems in determination of discount rates a commission has four basic options in present value analysis:

(1) Abandon all present value analysis: This option is not realistic since costs of alternate policies must often be evaluated through time on a comparible basis.

(2) Attempt development of an overall aggregate consumer discount rate and use this for all analysis: Although this is probably almost universally accepted in regulatory analysis of the CWIP and other issues, the above principles should demonstrate its absurdity. The method is over simplistic as well as potentially misleading. The fact that every customer of a utility could have a somewhat different discount rate necessitates utilizing some more sophisticated procedure.

(3) Develop a "break-even" discount rate: Although this procedure can be useful in evaluating two streams of revenues, the methodology loses much of its value if there are more than two streams. The procedure furthermore is problematic in excessively isolating one discount rate.

(4) Use present value figures under a range of reasonable discount rates: This is the preferred methodology used in our studies since costs to alternative groups of

customers can be evaluated. A commission can use such a range to evaluate the cost or savings from various policy options to different groups of customers.

The Time Frame Problem

As stated previously, the issue of CWIP vs. AFUDC affects revenues over the life of the plant at issue. However, ratepayers who will not remain in the utility's service territory throughout the life of the plant obviously care very little about revenue requirements after they have departed. Over a 35-40 year period represented by a nuclear plant these ratepayers do not represent a few unhealthy senior citizens or transient college students, rather the group can consist of a significant portion of the utility's customers. Furthermore, certain classes of customers (such as industrials) might be far less mobile than other customers. Finally, if CWIP is included in rate base many customers will move into the service territory during the "payback period" after a plant has come on line. These customers derive the benefits of CWIP without incurring any of the cost -- their "rate of return" on CWIP in rate base is infinite.

Under incremental analysis, if a ratepayer's cost of capital is equivalent to the utility's discount rate

a customer will not fully "earn" his cost of capital from CWIP in rate base until the final year of plant's life. If a corporate model together with certain assumptions is utilized (see my discussion below) it is possible to demonstrate that CWIP in rate base can result in a present value savings by the end of a plant's life. In this case sometime before the final year of the plant a consumer has experienced a break even point where the rate of return on CWIP in rate base is equivalent to his cost of capital. Due to the problems highlighted above of ratepayer mobility, the earlier this breakeven point, the more advantageous the policy. Hence, a further benefit of Staff's ROCC recommendation is that it dramatically accelerates the present value breakeven year, as does my recommendation to key construction financing to the low-end return on equity and/or a lower AFUDC equity rate to reflect the reduced risk inherent in the CIRIM plan.

Unstable Costs of Capital

Present value analysis of CWIP in Rate Base vs. AFUDC generally ignores effects of cost of capital varying through time. Yet if there is one certainty regarding money costs in our economy, it is that interest rates have not, and will not, remain stable through time. The

fact that variable money costs can have very important effects on costs of CWIP vs. AFUDC is demonstrated by considering what would have happened if CWIP were allowed in Edison's rate base in the 1960's. In this case Edison's cash flow would have been more in the 1960's (during the construction period) and less today (during the life of the plant) -- the company would have issued less very low cost (say 3%) debt in the 1960's but it would have to issue more high cost (say 15%) debt now. Thus because of the CWIP previously included in rate base, embedded rates on debt and preferred stock would have been substantially higher today due to the reduced cash flow. This higher embedded debt cost due to CWIP in rate base would have resulted in higher required rates of return for all of Edison's assets in each year of the plant's life.[8] Thus due to dramatic increases in cost of capital over the last 20 years CWIP in rate base would have been a highly expensive regulatory policy in the 1960's. Of course, on the other hand, if interest rates decline after the construction period, CWIP in rate base becomes a very cost effective regulatory policy.

The Appropriate Model For Present Value Analysis

All of the above considerations regarding present value

become irrelevant if the numbers which provide the basis for the present value calculations are fallacious. Exhibit AF-12 demonstrates that the regulatory policy of choosing CWIP vs. AFUDC can have significant impacts on invested capital taxes, property taxes, investment tax credit utilization, revenue taxes, and cost of capital. Since incremental studies (which have been used extensively by utilities and consumer groups alike) ignore these variables as well as regulatory lag and unstable costs of capital, such types of analysis are subject to question even before any numbers have been "present valued". Only through utilizing a long-term, company specific, corporate model can all of the ramifications of the commission's policy be evaluated. In the subsequent section of my testimony, I will present the results of a present value study of alternate regulatory policies related to Edison's construction program using a corporate model.

Present Value Study Results

The present value studies demonstrate:

(1) If CWIP or "CIRIM" is keyed to a lower return on equity, there are significant savings.

(2) If CWIP in rate base or "CIRIM" is keyed to a lower AFUDC rate the present value savings are also significant.

(3) The present value costs of higher costs of capital are significant.

Many of the significant assumptions used in the present value study are demonstrated in Exhibit AF-4.

My present value evaluations consist of three separate groups of studies:

(1) CWIP vs. AFUDC vs. LIRIM under "everything else is equal" assumptions.
(2) CWIP vs. AFUDC vs. CIRIM under varying equity returns.
(3) Effects of higher debt and preferred stock costs.

CWIP vs. AFUDC vs. CIRIM

In these studies I have utilized my corporate model and presented one of the reports from each scenario in Exhibit AF-11 (the full reports of the program consist of over 6,000 lines or 120 computer pages for each

scenario). In the first set of simulations, I have attempted to be conservative and bias results towards AFUDC by assuming no property tax effects, no cost of capital effects, and fairly stable interest rates. The simulations do, however, consider ITC utilization impacts, invested capital tax impacts, and embedded rate effects. From Exhibit AF-11 it can be determined that the break-even discount rate between AFUDC and "standard" CWIP in rate base is approximately fifteen percent. In other words, if a consumer's after tax discount rate is above 15% he prefers AFUDC, while if it is below 15% he prefers AFUDC (if he lasts until the year 2013). The breakeven rate between CIRIM and AFUDC, however, exceeds 25%.

The reports shown on Exhibit AF-11 can also be used to determine dollar costs of various policies. For example, at an after tax discount rate of 10% (this could conceivably be 20% before tax) and at a 16.25% return on equity, AFUDC costs $10.94 million more than CWIP in rate base and $66.5 million more than Staff's CIRIM plan. Similarly, the reports can be interpreted to suggest that at a 10% discount rate a consumer would be indifferent between CWIP and AFUDC in the year 1996. In other words, at a discount rate of 10%, if a ratepayer's time frame is

less than 13 years he prefers AFUDC, while he prefers CWIP for longer time frames. If the discount rate increases, this breakeven time frame also increases. Finally, comparing AFUDC to CIRIM instead of CWIP accelerates the breakeven year to 1986!

CWIP vs. AFUDC vs. CIRIM at Alternate Returns on Equity

If a CWIP in rate base or CIRIM policy is combined with low range returns on equity, the savings become dramatic. For example the breakeven discount rate between CWIP at a return on equity of 16.25% and AFUDC at a 17.6% ROE exceeds 25%; the savings at a discount rate at 10% increase from $10.94 million to $83.37 million; and there is no breakeven year. The savings are even more pronounced if Staff's CIRIM proposal at a 16.25% ROE is compared to AFUDC at 17.6%. For example now the savings at a 10% discount rate are $138.93 million.

Reducing the AFUDC rate also produces significant savings. For example lowering the AFUDC equity rate to 13.0% under Staff's CIRIM proposal can save rate payers $180.8 million at a discount rate of 10% as shown on Exhibit AF-11.

Effects of Higher Costs of Capital

The above analysis demonstrates the dramatic effects of an increase in cost of equity. If costs of debt and preferred stock increase due to exclusion of CWIP from rate base, the impacts are also very significant. Exhibit AF-11 shows that if incremental interest rates on new debt and preferred stock increase by one percentage point (for four years) the costs are as follows in the 17.6% ROE, AFUDC scenario:

Discount Rate	Cost
10%	$100.13 million
15%	$ 49.38 million
20%	$ 23.00 million

The costs are even more pronounced if the higher debt cost AFUDC scenarios are compared to Staff's CIRIM plan.

E. FINANCIAL INTEGRITY AND OTHER CONSIDERATIONS

I earlier discussed the beneficial effects of including CWIP in rate base on financial integrity. If the Commission would like to raise the interest ratio excluding AFUDC (which is analogous to Edison's mortgage indenture coverage) it should add amounts of CWIP to rate base -- possibly more than the company has requested. Figure 9

shows that with price increases of 4.22% in 1984, 12.03% in 1985, 7.40% in 1986 and 4.18% in 1987 (the CWIP in rate base case) that interest coverage excluding AFUDC substantially improves through time (from a low of 1.35 in 1979 to 4.17 in 1988).

FIGURE #9

COMMONWEALTH EDISON COMPANY

Interest Coverage - Excluding AFUDC

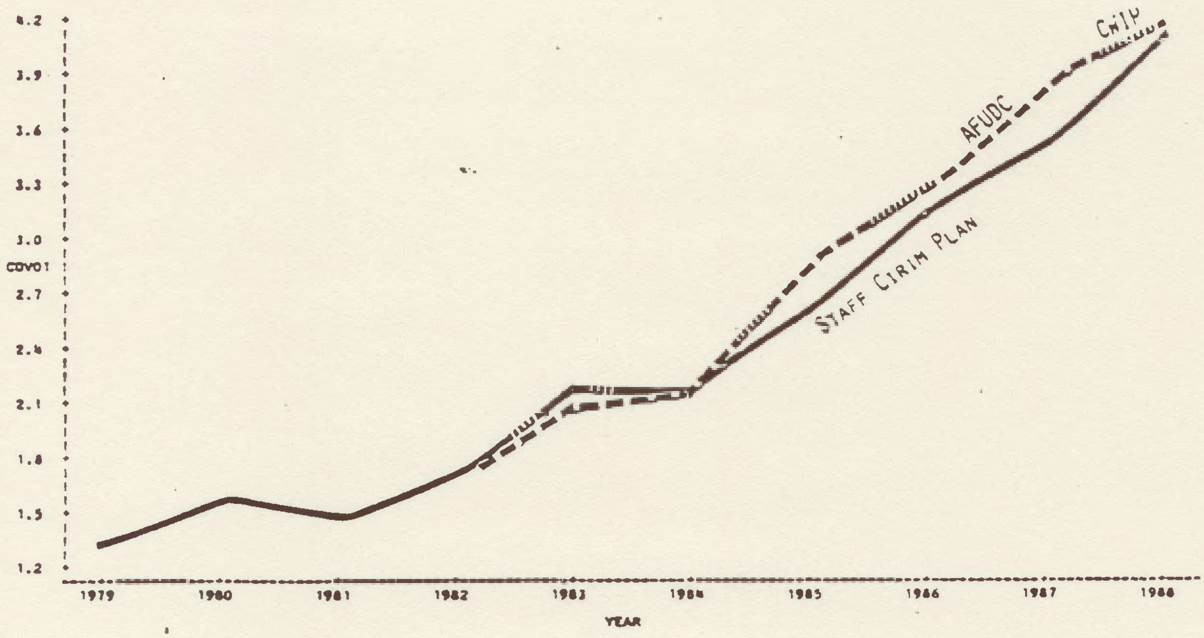
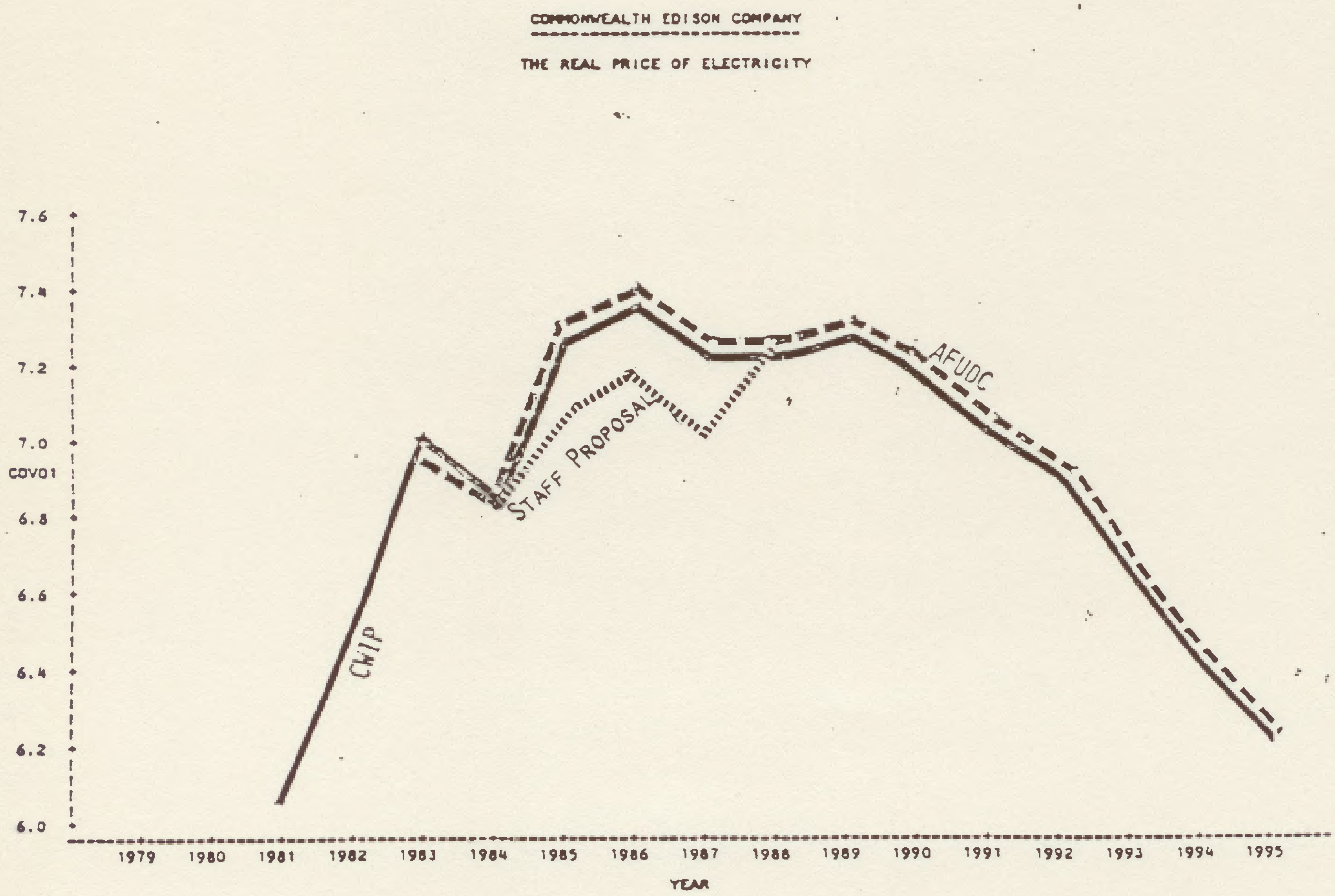


Figure #9 compares the CIRIM Plan -- assuming an instituted date of 1985 as demonstrated on Exhibit AF-12 -- to CWIP in rate base and to AFUDC in terms of coverage ratios. It can be seen that a principle effect of the CIRIM plan is to levelize coverage ratios through time.

In addition to smoothing coverage ratios, the Staff proposal levels real rates through time as demonstrated in the following graph:

FIGURE #10



From all of the above analysis it can safely be stated that although the CIRIM plan introduces slightly more complexity into the ratemaking procedure, the persuasive benefits of the proposal in rates better reflecting costs far outweigh the complexity introduced. Finally, as to proffered effects on efficiency and "over-building", it is my position that as long as market to book ratios remain below one to one, rational utility companies will have an incentive to issue as little equity as possible and, thus, will expand as little as possible.

Braidwood Questions

In this section I will attempt to estimate the cost or savings from a delay or abandonment of construction of the Braidwood Nuclear Units.* The sell-off option will not be analyzed; I recommended in the interim case that Edison consider selling certain assets, including generating plant CWIP; this recommendation has not changed.

The Staff emphatically agrees that Edison must do absolutely everything to hold costs (and thus rates) down in these difficult times. This can only come about through difficult improvements in efficiency including strenuous efforts to improve labor productivity, tough bargaining with suppliers, holding the line on wage increases, and other obvious measures. While options of delaying or abandoning construction projects may have appeal on the surface, a little analysis reveals that, in the case of Braidwood, these are not cost effective alternatives.

Braidwood Delay

My exhibit AF-2 of the interim case showed that a Braidwood stoppage provides no real improvement on financial indicators. Considering the fact that the 1983 Braidwood delay "savings" per Edison Exhibit 1A.18 (about $100 million) are only 16% of Edison's authorized short-term debt limit and about 10% of the 1983 external financing this is a logical result. Simply stated, the financial "breather" from delaying Braidwood

*Mr. Larson of the Commission Staff will provide detailed fuel savings numbers.

construction has little effects on Commonwealth Edison Company's corporate financial statements.

If Edison's cost estimates are accurate, on the other hand, the cost over the long-run from delay could be significant. On Edison's Exhibit 1A.18 the company claims that over an 18 month period, a Braidwood delay would increase the direct cost of the plant by $503 million. Adding financing costs, Exhibit AF-14 shows that the total cost of Braidwood would increase by $844.9 million in such a scenario.

Assuming no operating efficiencies the break-even discount rate for delay vs. no delay is approximately 20% based on Edison's numbers. (In AG Exhibit 8 Mr. Hurst uses a 10.6% discount rate). With this extremely delay-biasing assumption of no operating losses, at a discount rate of 10%, the cost to consumers of a delay is $359.5 million. Using Edison's front-end fuel savings numbers net of incremental operating expenses as shown on Exhibit AF-14, the breakeven discount rate exceeds 25% and the cost of delay at 10% is $652 million (this assumes no "back-end" operating effects).

The AG's witness Komanoff argues that Edison's current Braidwood estimate is "particularly suspect" (AG Exhibit 7, pp. 22-24). I have utilized his midrange estimate (in nominal dollars) as shown on AG Exhibit 7 Schedule 3 which increases Braidwood direct costs by $363 million. With the addition of AFUDC this estimate becomes $453.52 million as shown on Exhibit AF-14. I will compare Mr. Komanoff's

no delay estimate to Edison's delay estimate. This obviously heavily biases the results in favor of delay since there is an inherent assumption that Edison would not experience "Komanoff overruns" in the delay scenario while it would incur these costs in the no-delay runs. If the simulation is further biased toward delay by assuming no operating efficiencies, the break even discount rate falls to under 10%. However if Edison's front-end operating efficiencies are assumed (Staff Witness Larson will provide better estimates), then the breakeven discount rate is again above 25% and the cost at 10% of delay is $174.19 million.

Finally, it should be noted that in the years 1985-1988 during which a Braidwood delay could possibly lower prices the reduced rates from Staff's CIRIM proposal would outweigh these delay "savings."

Braidwood Abandonment

On page 10 of AG Exhibit 7 Mr. Komanoff states his "...advocacy of substituting 300 MW coal units for nuclear units up to 40 percent complete." Using his Braidwood cost estimates, at the end of 1982 Braidwood Unit #1 is 55% complete and Unit #2 is 45% complete in nominal dollars (See Exhibit AF-14).

I have made a very rough estimate of the costs of Braidwood abandonment by comparing Mr. Komanoff's estimates to an abandonment scenario. Here I assume that Braidwood capital costs would be recovered through rates and that Edison's operating efficiency estimates would occur

throughout the life of the plant. This is in fact a conservative assumption since at some time Edison would presumably have the need for additional capacity which would magnify the operating loss numbers. Compared to the Komanoff estimate case this abandonment scenario yields a breakeven discount rate of above 25% and costs ratepayers 1.34 BILLION DOLLARS at a discount rate of 10%.

While my analysis would suggest that abandonment or delay is not in the interest of ratepayers there are several assumptions I have made which may not be valid. First as I stated earlier I have used a range of fuel savings estimates and the magnitude of the savings or costs from delay or abandonment are sensitive to those fuel savings estimates. Secondly I have assumed that the Company is not constrained by contractual arrangements which require Edison to purchase coal in excess of requirements. An analysis which explicitly addresses both fuel cost and contractual constraints could substantially reduce the savings or even tip the results in favor of delay or abandonment. Both of these issues are addressed by Mr. Larson.

Docket No. 8491
VIPRG Exhibit EB-6

Moody's Bond Yield Averages
For Public Utility Bonds

Year	Month	A Bonds	Baa Bonds	Difference
1984	12	13.11	13.48	0.36
1985	1	12.99	13.36	0.37
1985	2	13.08	13.44	0.36
1985	3	13.87	14.19	0.32
1985	4	13.51	14.11	0.60
1985	5	13.12	13.62	0.50
1985	6	12.13	12.66	0.53
1985	7	12.07	12.70	0.63
1985	8	12.13	12.73	0.60
1985	9	12.13	12.72	0.59
1985	10	12.01	12.52	0.51
1985	11	11.49	12.04	0.55
1985	12	10.87	11.48	0.61
1986	1	10.79	11.24	0.45
1986	2	10.26	10.74	0.48
1986	3	9.48	9.91	0.43
1986	4	9.14	9.63	0.49
1986	5	9.59	10.04	0.45
1986	6	9.62	10.03	0.41
1986	7	9.37	9.69	0.32
1986	8	9.29	9.70	0.41
1986	9	9.52	9.96	0.44
1986	10	9.52	9.95	0.43
1986	11	9.28	9.69	0.41
1986	12	9.12	9.49	0.37
1987	1	8.95	9.27	0.32
1987	2	9.00	9.24	0.24
1987	3	8.93	9.19	0.26
1987	4	9.38	9.85	0.47
1987	5	9.91	10.40	0.49
1987	6	10.02	10.46	0.44
1987	7	10.15	10.62	0.47
1987	8	10.45	10.90	0.45
1987	9	11.22	11.58	0.36
1987	10	11.34	11.91	0.57
1987	11	10.82	11.40	0.58
1987	12	10.99	11.56	0.57
1988	1	10.76	11.34	0.58
1988	2	10.10	10.65	0.55
1988	3	10.09	10.69	0.60
1988	4	10.54	11.23	0.69
1988	5	10.81	11.38	0.57
1988	6	10.79	11.27	0.48
1988	7	11.04	11.52	0.48
1988	8	11.17	11.69	0.52
1988	9	10.61	11.13	0.52
1988	10	10.01	10.31	0.30
1988	11	9.90	10.35	0.45
1988	12	10.06	10.44	0.38
1989	1	10.08	10.38	0.30
1989	2	10.07	10.38	0.31
1989	3	10.23	10.50	0.27
1989	4	10.18	10.49	0.31
1989	5	9.99	10.29	0.30
1989	6	9.64	9.80	0.16
1989	7	9.50	9.64	0.14
1989	8	9.52	9.64	0.12
1989	9	9.58	9.70	0.12
1989	10	9.54	9.64	0.10
1989	11	9.51	9.64	0.13
1989	12	9.44	9.60	0.16
1990	1	9.56	9.74	0.18
1990	2	9.76	9.96	0.20
1990	3	9.85	10.06	0.21
1990	4	9.92	10.13	0.21
1990	5	10.00	10.16	0.16
1990	6	9.80	9.96	0.16
1990	7	9.75	9.92	0.17
1990	8	9.92	10.12	0.20
1990	9	10.12	10.32	0.20
1990	10	10.06	10.29	0.23
1990	11	9.90	10.12	0.22
1990	12			
Average		10.43	10.80	0.38